

ABSTRACT OF THE DISCLOSURE

5 A "hybrid" or macrocomposite guideway, wherein the "traditional" or existing guideway material (e.g., hardened steel) is maintained as the wear resistant, low friction surface intended to be in physical contact with one or more bearings, and further wherein this surface is backed up or supported by a substrate comprising a stiff, lightweight material. This macrocomposite guideway combines the desirable friction and wear characteristics
10 of the traditional bearing materials with the stiffness and low mass of advanced materials. Candidate substrate materials include composites having a ceramic and/or a metallic matrix, monolithic ceramics or monolithic light metals. A cladding comprising the hardened steel wear surface layer may be attached to the rigid, lightweight substrate by adhesive bonding, mechanical fasteners or other mechanical fit such as a friction or
15 interference fit. Preferably, though, the attachment is by means of a metallurgical bond. In a particularly preferred embodiment, a silicon carbide particulate reinforced aluminum composite is metallurgically bonded to a tool steel wear surface using an "active" soldering composition. A gib that utilizes such guideways is useful in machines requiring fast and precise movement of one part relative to another, such as in machines for
20 semiconductor chip fabrication and assembly.